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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,625	03/29/2004	Tom E. Pearson	42390.P17184	3475

8791 7590 03/16/2006

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EXAMINER

ABOAGYE, MICHAEL

ART UNIT	PAPER NUMBER
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1725

DATE MAILED: 03/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/812,625

Applicant(s)

PEARSON ET AL.

Examiner

Michael Aboagye

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01/03/2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 – 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Searls et al. (US Patent no. 6730860) in view of Zohar et al. (US Patent no. 6754551)

Searls et al. teaches a method of constructing an electronic assembly comprising: having a plurality of conductive contact pads on a first substrate, said plurality of conductive pads consisting of conductive power pads (20A), conductive ground pads (20B) and conductive signal pads (20C); attaching a plurality of power solder balls (36A) to the conductive power contact pads, a plurality of ground solder balls (36B) to the conductive ground contact pads and a plurality of signal solder balls (36C) to the conductive signal pads; said power balls being spaced from one another, ground balls being spaced from one another and signal balls being spaced from one another; the power solder balls and ground solder balls being spaced from one another by a first distance and the signal solder balls being spaced from one another by a second distance which is larger than the first distance; locating the solder balls against terminals of a second substrate; and reflowing the solder balls against the bond pads by heating the solder balls, the power solder balls combining with one another and the

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ground solder balls combining with one another while the signal solder balls remain disconnected from one another; and allowing the solder balls to cool so that they solidify(Figures 1 and 2; column 1, line 56 – column 3, line 67); wherein one power solder ball has the same mass as one signal solder ball(see column 2, line 64 – column 3, line 14); wherein the power and ground solder balls form power and ground solder bumps located directly adjacent one another and have lengths extending substantially parallel to one another so as to have surfaces facing one another to form a capacitor; wherein a plurality of power bumps and ground bumps alternating with one another to form a plurality of capacitors (see column 4, lines 10 – 23).

Searls et al. does not teach forming a removable solder mask partially over at least a first of said plurality of conductive pads of said first substrate and a permanent solder masks on the first substrate which defines the conductive contact pads, the permanent solder mask remaining on the substrate when the removable solder mask is removed.

However Zahor et al. discloses the application of permanent and temporary (removable) solder resist (solder mask) in the manufacturing steps of printed circuit board; wherein the temporary and permanent solder masks are used to protect selected areas from certain interaction with solder alloy; temporary masks are applied to keep solder alloy out of selected holes and also allow temperature or process-sensitive components to be added later, they are removed by peeling or by cleaning agents, while permanent solder masks are not removed after being applied(Zahor et al. , column 4 lines 6 – 37; abstract and column 8, line 56 – column 9, line 52).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modify the method of constructed the electronic assembly of Searls et al. by forming a removable solder mask on the plurality of conductive pads of the first surface, and a permanent solder mask on the first substrate in view of the teachings of Zohar et al in order to protect the selected areas from certain interaction with solder alloy or coming into contact with the solder alloy (Zohar et al., column 4 lines 6 – 37; abstract and column 8, line 56 – column 9, line 52).

The applied reference Searls et al. (US Patent no. 6730860) has one common inventor and an assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Response to Arguments

3. The examiner acknowledges the applicants' amendment received by USPTO on January 3, 2006. The correction of the informalities in the drawing and the specification are approved. Claims 1-15 remain under consideration.

4. Applicants' arguments filed on January 3, 2006 have been fully considered but they are not persuasive. Applicants' remarks/ arguments set forth on pages 9-13 of the amendment is mainly directed to Zohar et al. reference. The applicants' assert that Zohar et al. solder resist mask is never used for assisting in the attachment of balls nor assisting in placement of and maintaining a separation between solder balls. The examiner sees no evidence of this statement regarding the limitations set forth in the claimed invention; hence the statement is not pertinent to the claims 1-15. What is not expressly disclosed in Searls et al. reference are the limitations comprising: forming a removable solder resist mask over the conductive contact pads and forming a permanent solder mask on the conductive contact pads. However these limitations are disclosed by Zohar reference (Zohar et al., column 4 lines 6 – 37; abstract and column 8, line 56 – column 9, line 52). It is noted that Zohar et al. reference provides a valid remedy to Searls et al. reference. The examiner therefore respectfully disagrees with the applicants' assertion that the combination of Searls et al. and Zohar et al. fail to teach the limitations set forth in claims 1-15. The pending claims 1-15 therefore remain rejected under 35 U.S.C. 103(a) by the combination of Searls et al. and Zohar et al.

Conclusion

5. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.


6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AM
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Michael Aboagye
Assistant examiner
Art Unit 1725

03/14/2006

KEVIN KERNS *Kevin Kerns 3/15/06*
PRIMARY EXAMINER